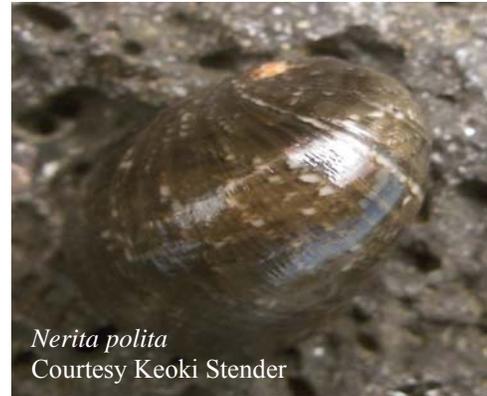


Marine Invertebrates

Snails



IUCN Red List - Not considered
All Endemic except for *Charonia*, *Cypraea tessellata*, *Cypraea tigris*, *Duplicaria gouldi*, *Epitonium ulu*, *Nerita* sp., *Strombus vomer*, and *Turbo*



SPECIES INFORMATION: The species with common names and Hawaiian names are: pu or triton's trumpet (*Charonia tritonis*), burnt murex (*Chicoreus insularum*), Burgess' cowry (*Cypraea burgessi*), leho or Maui cowry (*C. mauiensis*), leho or Ostergaard's cowry (*C. ostergaardi*), leho or Rasleigh's cowry (*C. rasleighana*), leho or groove-toothed cowry (*C. sulcidentata*), leho or checkered cowry (*C. tessellata*), tiger cowry (*C. tigris*), pūpū loloa or Gould's auger (*Duplicaria gouldi*), fungiid wentletrap (*Epitonium ulu*), pipipi or black nerite (*N. picea*), kūpe'e or polished nerite (*N. polita*), Hawaiian seagrass snail (*Smaragdia bryannae*), alīlea or Hawaiian stromb (*Strombus vomer*), and pūpū mahina or Hawaiian turban (*Turbo sandwicensis*). Many of the other species are from deep or very deep waters. Pu reaches twenty inches in length (second largest snail in the Pacific) and feeds on sea stars and sea urchins, including crown-of-thorns starfish. *Chicoreus* and pūpū'ala are carnivores. *Chicoreus* feeds exclusively on bivalves by drilling through the bivalve's shell and inserting a digestive enzyme, and ingesting the tissues through its proboscis. Leho or cowries are nocturnal and can be herbivores and omnivores as well as sponge feeders. Hawaiian individuals of *C. tigris* are the largest in the world. Pūpū loloa feed solely on the yellow acorn worm (*Ptychodera flava*). The fungiid wentletrap (*Epitonium*) is associated with a solitary coral *Fungia scutaria*. Nerites (*Nerita* and *Smaragdia*) and alīlea are exclusively herbivores and feed on algae. Kūpe'e is nocturnal. Female leho lay eggs in triangular capsules that are attached to the substrate. Eggs develop for one to two weeks. The fungiid wentletrap pelagic stage lasts about 39 days. Nerites lay eggs in capsules that adhere tightly to the surface of rocks and shells. Settlement of nerite veligers peaks in the winter. *Hastula*, *Terebra*, and *Duplicaria* were traditionally used for many types of tools and implements by native Hawaiians.

DISTRIBUTION: Pu, the burnt murex, lehos, pipipi and kūpe‘e, alīlea, pūpū mahina, and pūpū loloa are found throughout the Archipelago; however, pūpū loloa is rare or possibly absent on the island of Hawai‘i. The fungiid wentletrap is found only in Kāne‘ohe Bay, O‘ahu. *Nerita plicata* is found only on the Northwestern Hawaiian Islands and *Smaragdia byrannae* is found specifically at Anini, Kaua‘i; Kāne‘ohe Bay, O‘ahu; and near Kaunakakai, Moloka‘i. The *Nesiodostoma* species are only found on Kaua‘i and O‘ahu. Distribution is poorly known as sampling has been inadequate for most other species. Some very deep species have only been collected once or twice.

ABUNDANCE: Specific abundance for cowries is unknown, but many are rare such as pu, *Cypraea mauiensis*, *C. ostergaardi*, and *C. tigris*. Alīlea is also very rare today. Abundance for others is largely unknown as there is no systematic monitoring.

LOCATION AND CONDITION OF KEY HABITAT: The burnt murex is found at depths of 18 meters (60 feet) or more. Pūpū‘ala key habitat is on benches and sandy substrate of reef platforms. Most lehos are found in shallow waters to 60 meters (200 feet). *C. mauiensis* is restricted to shallow waters, while *C. rashleighana* and *C. sulcidentata* are found in more moderately deep waters. *C. ostergaardi* is the only cowry found exclusively in deep waters. *C. mauiensis* has additional key breeding habitat on the leeward side of Maui. Pūpū loloa inhabits the casting of large acorn worms. The fungiid wentletrap lives on a solitary coral *Fungia scutaria* in Kāne‘ohe Bay, an area that has been severely degraded. Key habitat for both pipipi and *N. plicata* is intertidal areas, but kūpe‘e is found under sand at the high tide line. *Smaragdia bryannae* is found on fringing and patch reefs only in association with the marine angiosperm *Halophila hawaiiiana*. Alīlea lives up to 25 meters (80 feet) deep in sand. Pūpū mahina is common to 18 meters (60 feet) deep. *Allochroa*, *Blauneria*, and *Pedipes* are supratidal pulmonates. Key habitat for many other species is poorly known.

THREATS:

- Localized excessive harvesting of these species for their shells by collectors and for cultural uses is the primary threat to these snail species. In recent years the rise of internet businesses and online auctions has increased the market for these shells, and thus the pressure, on many snails. *Cypraea mauiensis* is extremely rare due to over collection;
- Kūpe‘e was eaten by Native Hawaiians and used in shell lei as are many others;
- Pollution is another threat for those found in intertidal areas and shallow waters.

CONSERVATION ACTIONS: In addition to common statewide and marine conservation actions, specific actions include:

- Maintain healthy populations with appropriate fishing regulations, enforcement, and education.

MONITORING:

- Survey for populations and distribution in known and likely habitats.

RESEARCH PRIORITIES:

- Improve understanding of factors affecting the species population size and distribution.

References:

Gulko D. 2005. Hawai'i endemic species status chart spreadsheet. Honolulu, HI: Hawai'i Division of Aquatic Resources.

Gulko D. 2004. Hawaiian marine species for ESA Candidate listing revised Candidate list. Honolulu, HI: Division of Aquatic Resources, State of Hawai'i.

Hoover JP. 1998. Hawaii's sea creatures: A guide to Hawaii's marine invertebrates. Honolulu, HI: Mutual Publishing. 366 pp.

Kay AE. 1979. Hawaiian marine shells reef and shore fauna of Hawaii, section 4: Mollusca. Honolulu, HI: Bishop Museum Press. 653 pp.

Snail SGCNs

Family	Scientific Name	Hawaiian Name	Common Name
Fissurellidae	<i>Emarginula hawaiiensis</i>	None	None
Fissurellidae	<i>Tugali oblonga</i>	None	None
Skeneidae	<i>Brookula iki</i>	None	None
Trochidae	<i>Calliostoma doncorni</i>	None	None
Trochidae	<i>Calliotropis reticulina</i>	None	None
Trochidae	<i>Euchelus fimbriatus</i>	None	None
Trochidae	<i>Tristichotrochus margaritissimus</i>	None	None
Trochidae	<i>Galeoastrea midwayensis</i>	None	None
Trochidae	<i>Turbo sandwicensis</i>	`ailea	Hawaiian turban
Neritidae	<i>Nerita picea</i>	pipipi, pipipi kai	Black nerite
Neritidae	<i>Nerita plicata</i>	None	None
Neritidae	<i>Nerita polita</i>	kūpe'e	Polished nerite
Neritidae	<i>Smaragdia bryanae</i>	None	HI sea grass snail
Phenacolepadidae	<i>Phenacolepas aculeata</i>	None	None
Cerithiidae	<i>Cerithium boeticum</i>	None	None
Dialidae	<i>Mellitestia scopulorum</i>	None	None
Fossaridae	<i>Fossarus garrettii</i>	None	None
Triphoridae	<i>Iniforis hinuhinu</i>	None	None
Triphoridae	<i>Iniforis perfecta</i>	None	None
Triphoridae	<i>Litharium maculata</i>	None	None
Triphoridae	<i>Mastonia gracilis</i>	None	None
Triphoridae	<i>Viriola fallax</i>	None	None
Triphoridae	<i>Metaxia albicephala</i>	None	None
Triphoridae	<i>Metaxia tricarinata</i>	None	None
Triphoridae	<i>Triphora bicolor</i>	None	None
Triphoridae	<i>Triphora chrysolitha</i>	None	None

Family	Scientific Name	Hawaiian Name	Common Name
Triphoridae	<i>Triphora earlei</i>	None	None
Triphoridae	<i>Triphora keiki</i>	None	None
Triphoridae	<i>Triphora laddi</i>	None	None
Triphoridae	<i>Triphora peasi</i>	None	None
Triphoridae	<i>Triphora pustulosa</i>	None	None
Triphoridae	<i>Triphora thaanumi</i>	None	None
Littorinidae	<i>Nodilittorina hawaiiensis</i>	None	None
Epitoniidae	<i>Epitonium oahuense</i>	None	None
Epitoniidae	<i>Epitonium ulu</i>	None	None
Epitoniidae	<i>Laeviscala luceo</i>	None	None
Epitoniidae	<i>Opalia burchorum</i>	None	None
Cingulopsidae	<i>Eatoniopsis conica</i>	None	None
Cingulopsidae	<i>Eatoniopsis ponderi</i>	None	None
Eatoniellidae	<i>Eatoniella janetaylorae</i>	None	None
Rastodontidae	<i>Rastodens brevilabiosa</i>	None	None
Rastodontidae	<i>Rastodens labiosa</i>	None	None
Eulimidae	<i>Melanella acanthyllis</i>	None	None
Eulimidae	<i>Melanella brunnimaculata</i>	None	None
Eulimidae	<i>Melanella bryani</i>	None	None
Eulimidae	<i>Melanella conoidalis</i>	None	None
Eulimidae	<i>Melanella kanaka</i>	None	None
Eulimidae	<i>Melanella letsonae</i>	None	None
Eulimidae	<i>Melanella solida</i>	None	None
Eulimidae	<i>Mucronalia ovata</i>	None	None
Eulimidae	<i>Pelseneeria hawaiiensis</i>	None	None
Eulimidae	<i>Trochostilifer entospinea</i>	None	None
Eulimidae	<i>Trochostilifer hawaiiensis</i>	None	None
Eulimidae	<i>Vitreolina chondrocidaricola</i>	None	None
Eulimidae	<i>Vitreolina hawaiiensis</i>	None	None
Barleeidae	<i>Barleeia calcareae</i>	None	None
Caecidae	<i>Caecum oahuense</i>	None	None
Caecidae	<i>Caecum sandwichensis</i>	None	None
Caecidae	<i>Strebloceras subannulatum</i>	None	None
Rissoidae	<i>Elachisina robertsoni</i>	None	None
Rissoidae	<i>Pelycidion habeii</i>	None	None
Rissoidae	<i>Merelina hewa</i>	None	None
Rissoidae	<i>Pyramidelloides suta</i>	None	None
Strombidae	<i>Strombus hellii</i>	None	None
Strombidae	<i>Strombus vomer</i>	None	Hawaiian stromb
Vanikoridae	<i>Vanikoro imbricata</i>	None	None
Vermetidae	<i>Dendropoma psarocephala</i>	None	None
Vermetidae	<i>Dendropoma rhyssaconcha</i>	None	None
Cypraeidae	<i>Cypraea burgessi</i>	None	Burgess' cowry
Cypraeidae	<i>Cypraea mauiensis</i>	leho	Maui cowry
Cypraeidae	<i>Cypraea ostergaardi</i>	leho	None
Cypraeidae	<i>Cypraea rashleighana</i>	leho	Rashleigh's cowry
Cypraeidae	<i>Cypraea sulcidentata</i>	leho	Groove-toothed cowry
Cypraeidae	<i>Cypraea tessellata</i>	leho	Checkered cowry

Family	Scientific Name	Hawaiian Name	Common Name
Cypraeidae	<i>Cypraea tigris</i>	None	Tiger cowry
Ovulidae	<i>Phenacovolva lahainaensis</i>	None	None
Ovulidae	<i>Spiculata michaelkingi</i>	None	None
Naticidae	<i>Euspira sandwichensis</i>	None	None
Naticidae	<i>Natica sp.</i>	None	None
Naticidae	<i>Eunaticina margaritaeformis</i>	None	None
Bursidae	<i>Bursa luteostoma</i>	None	None
Cassidae	<i>Phalium umbilicatum</i>	None	None
Personidae	<i>Distorsio burgessi</i>	None	None
Ranellidae	<i>Charonia tritonis</i>	pū	Triton's trumpet
Ranellidae	<i>Fusitron midwayensis</i>	None	None
Pickworthiidae	<i>Microliotia hawaiiensis</i>	None	None
Buccinidae	<i>Cantharus farinosus</i>	None	None
Buccinidae	<i>Engina albocinta</i>	None	None
Coralliophilidae	<i>Hirtomurex goodwini</i>	None	None
Coralliophilidae	<i>Latiaxis cuspidifera</i>	None	None
Fascioliariidae	<i>Latirulus fasciatus</i>	None	None
Muricidae	<i>Chicoreus insularum</i>	None	Burnt murex
Muricidae	<i>Favartia garrettii</i>	None	None
Muricidae	<i>Trophonopsis kayae</i>	None	None
Thaididae	<i>Morula foliacea</i>	None	None
Thaididae	<i>Neothais harpa</i>	None	None
Costellariidae	<i>Vexillum cosmani</i>	None	None
Costellariidae	<i>Vexillum wolfei</i>	None	None
Costellariidae	<i>Vexillum oryzum</i>	None	None
Harpidae	<i>Harpa goodwini</i>	None	None
Marginellidae	<i>Cystiscus huna</i>	None	None
Mitridae	<i>Neocancilla waikikiensis</i>	None	None
Mitridae	<i>Scabricola newcombii</i>	None	None
Mitridae	<i>Subcancilla foveolata</i>	None	None
Mitridae	<i>Mitra earlei</i>	None	None
Olividae	<i>Oliva richerti</i>	None	None
Olividae	<i>Olivella apicalis</i>	None	None
Volutomitridae	<i>Volutomitra pailoloana</i>	None	None
Terebridae	<i>Hastula inconstans</i>	None	None
Terebridae	<i>Terebra castaneostrata</i>	None	None
Terebridae	<i>Duplicaria thaanumi</i>	None	None
Terebridae	<i>Duplicaria gouldi</i>	None	None
Turridae	<i>Ceritoturris bittium</i>	None	None
Turridae	<i>Clavus rissoiniformis</i>	None	None
Turridae	<i>Clavus nodilifera</i>	None	None
Turridae	<i>Clavus mighelsi</i>	None	None
Turridae	<i>Clavus powelli</i>	None	None
Turridae	<i>Daphnella sandwicensis</i>	None	None
Turridae	<i>Eucyclostoma albomaculata</i>	None	None
Turridae	<i>Kermia brunnea</i>	None	None
Turridae	<i>Kermia cylindrica</i>	None	None
Turridae	<i>Kermia producta</i>	None	None
Turridae	<i>Kermia pumilla</i>	None	None

Family	Scientific Name	Hawaiian Name	Common Name
Turridae	<i>Pseudodaphnella pulchella</i>	None	None
Turridae	<i>Tritonoturris paucicostata</i>	None	None
Turridae	<i>Vepracula brunonia</i>	None	None
Turridae	<i>Anacithara perfecta</i>	None	None
Turridae	<i>Eucithara pusilla</i>	None	None
Turridae	<i>Glyphostoma hikihiki</i>	None	None
Turridae	<i>Lienardia balteata</i>	None	None
Turridae	<i>Paramontana exilis</i>	None	None
Turridae	<i>Comitas oahuensis</i>	None	None
Turridae	<i>Gemmula interpolata</i>	None	None
Turridae	<i>Gemmula microscelida</i>	None	None
Turridae	<i>Gemmula pseudomonilifera</i>	None	None
Turridae	<i>Gemmula tessellata</i>	None	None
Turridae	<i>Turridrupa weaveri</i>	None	None
Turridae	<i>Lophiotoma castanella</i>	None	None
Turridae	<i>Lophiotoma cerithiformis</i>	None	None
Turridae	<i>Lophiotoma gemmuloides</i>	None	None
Pyramidellidae	<i>Evalea waikiensis</i>	None	None
Pyramidellidae	<i>Herviera patricia</i>	None	None
Pyramidellidae	<i>Kolonela hawaiiensis</i>	None	None
Pyramidellidae	<i>Miralda paulbartschi</i>	None	None
Pyramidellidae	<i>Nesiodostomia montforti</i>	None	None
Pyramidellidae	<i>Nesiodostomia quarta</i>	None	None
Pyramidellidae	<i>Nesiodostomia quinta</i>	None	None
Pyramidellidae	<i>Odostomia margarita</i>	None	None
Pyramidellidae	<i>Pyramidella canaliculata</i>	None	None
Pyramidellidae	<i>Turbonilla thaanumi</i>	None	None
Melampidae	<i>Allochroa bronni</i>	None	None
Melampidae	<i>Blauneria gracilis</i>	None	None
Melampidae	<i>Pedipes sandwicensis</i>	None	None